

What is claimed is:

12. A device for producing at least one line, or a group of lines of electromagnetic radiation of the optical spectral range in a preselectable three-dimensional area, the at least one line, or the group of lines, are used as positioning aids, or geometry detection aids, the device comprising at least one conversion unit which is at least partially transparent to the electromagnetic radiation used and which can convert the electromagnetic radiation passing through it, such that the electromagnetic radiation forms the at least one line, or the group of lines in a given three-dimensional wherein the conversion unit comprises at least one refractive element, by refraction of the radiation passing through the at least one conversion unit on at least one optically functional interface of the refractive element the at least one line or the group of lines being formed in a given three-dimensional area.

13. The device as claimed in claim 12, wherein the at least one optically functional interface of the at least one refractive element has a freely selectable configuration which is suitable for the at least one line or the group of lines to be produced.

14. The device as claimed in claim 12, wherein the at least one optically functional interface of the at least one refractive element is divided into segments.

15. The device as claimed in claim 14, wherein the segments have the same size and have an identical shape.

16. Device as claimed in claim 14, wherein the segments have a cylinder lens geometry, and wherein two groups of the segments, with cylinder axes of cylinder geometry, and the axes of the two groups being perpendicular to one another.

17. The device as claimed in claim 16, wherein the cylinder lens geometry of the segments is a spherical or an aspherical cylinder lens geometry.

18. The device as claimed in claim 12, wherein the at least one line is a straight line or a curved line.

19. The device as claimed in claim 12, wherein the group of lines can be crosses, triangles, polygons or lattices, and the at least one line, which form the group of lines can be on top of one another at a right angle or at an angle which differs from a right angle.

20. The device as claimed in claim 12, wherein the at least one line or the group of lines are curved such that they image a planar orthogonal lattice, when they encounter a curved surface of a workpiece in a given three-dimension area on the latter.

21. The device as claimed in claim 12, wherein the device further comprises a laser light source for producing the electromagnetic radiation.

22. Robots for machining of workpieces comprising a device as claimed in claim 12.